



**U.S. Department of the Interior
Office of Inspector General**

AUDIT REPORT

**SAFETY OF DAMS PROGRAM,
BUREAU OF INDIAN AFFAIRS**

**REPORT NO. 95-I-422
FEBRUARY 1995**



United States Department of the Interior

OFFICE OF INSPECTOR GENERAL
Washington, D.C. 20240

MEMORANDUM

FEB 10 1995

TO: The Secretary
FROM: Acting Inspector General

SUBJECT' SUMMARY: Final Audit Report for Your Information - "Safety of Dams Program, Bureau of Indian Affairs" (No. 95-I-422)

DISCUSSION: We concluded that the Bureau of Indian Affairs had significantly improved the management of its dam safety program since our September 1989 audit report was issued and was implementing the recommendations contained in the report. However, we reported that further program efficiencies could be achieved if the Bureau streamlined its corrective action process and improved its ability to respond to emergency conditions. Specifically, the Bureau's process of identifying and correcting dam safety deficiencies was time consuming and did not allow managers the flexibility to deviate from the process and to recommend less costly or nonstructural alternatives to mediate identified deficiencies, particularly at many smaller Bureau dams. Also, the Bureau needed to install early warning systems, which would be an inexpensive alternative to more costly rehabilitation work at or near those dams identified as posing a high or significant hazard to public safety. This would enable the Bureau to more effectively monitor the conditions affecting a dam and warn or evacuate people at risk of impending dam failures. The Bureau also has not prepared emergency action plans for over half of its high or significant hazard dams and has not tested or updated the plans it has completed. Such plans, which detail the procedures to be followed during emergencies, are essential to the Bureau's effectiveness in protecting lives and property.

We made recommendations relating to opportunities for the Bureau to improve efficiency in its dam safety program. The Bureau agreed to install early warning systems and to prepare, test, and update emergency plans but stated that its present corrective action process already allowed for the selection and implementation of economic and timely remediation alternatives. Based on the Bureau's response, two recommendations were considered resolved but not implemented, and the Bureau was requested to reconsider its position on the remaining recommendation.



Joyce N. Fleischman

Attachment

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United States Department of the Interior

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FEB 3 1995

MEMORANDUM AUDIT REPORT

To: Assistant Secretary for Indian Affairs

From: Acting Assistant Inspector General for Audits

Subject: Final Audit Report on the Safety of Dams Program, Bureau of Indian Affairs (No. 95-I-422)

INTRODUCTION

This report presents the results of our audit of the Bureau of Indian Affairs safety of dams program. Our objective was to determine whether the Bureau had taken sufficient actions to address the recommendations made in our September 5, 1989, audit report entitled "Dam Safety Program, Bureau of Indian Affairs" (No. 89-108). We also evaluated the Bureau's safety of dams program from an economy and efficiency perspective. Overall, we found that the Bureau had taken corrective actions to address the recommendations presented in our prior audit report. Although the Bureau has improved its overall management of the safety of dams program, we believe that the Bureau could increase program economy and efficiency by streamlining the corrective action process, by installing early warning systems, and by preparing and updating emergency action plans.

BACKGROUND

The Department of the Interior's safety of dams program was established in February 1980 by Secretarial Order No. 3048, which provided that dams should be periodically inspected and actions taken to correct identified or suspected safety problems. Safety problems include design deficiencies, inadequate spillway capacity, dam seepage, and excessive vegetation that pose an immediate or future threat to the integrity of the dams and potentially affect downstream lives or property. As part of the program, the Department prepares and approves an annual technical priority rating that lists its "high" or "significant" hazard dams¹ based on a

¹The hazard is "high" if failure of the dam would result in a loss of life of more than six persons or in excessive economic loss. The hazard is "significant" if the loss of life would be from one to six persons or the economic loss is appreciable.

"risk-of-failure"² assessment performed for each dam. The technical priority rating approved in June 1992 contained 387 dams, of which 70 were Bureau dams. The Department has issued two subsequent draft ratings, the latest of which (May 1994) listed 94 Bureau dams. The Secretarial Order also designated the Bureau of Reclamation as the agency responsible for providing overall coordination of the Departmental program and for developing standards, criteria, and guidelines for structural design and safety inspections.

The Bureau of Indian Affairs is responsible for ensuring that its safety of dams program complies with Departmental standards, criteria, and guidelines, including the inspection of dams for safety deficiencies and the correction of any identified problems. In July 1987, the Bureau of Indian Affairs entered into an interagency agreement with the Bureau of Reclamation wherein Reclamation would perform safety evaluations on a cost-reimbursable basis. The results of these evaluations are presented in safety evaluation of existing dams reports, which describe the hazard potential posed by the dams and assess their safety condition. The Bureau of Indian Affairs is required by Departmental regulations to implement a prescribed corrective action process to address any identified safety deficiencies. The prescribed process includes four sequential phases: (1) the deficiency verification phase, which assesses through field investigations the extent and seriousness of any actual or potential safety deficiency; (2) the conceptual design phase, which examines alternatives for resolving the safety deficiencies noted in the deficiency verification phase; (3) the final design phase, during which the preferred alternative is selected and appropriate environmental documentation is prepared; and (4) the construction phase, which is the dam rehabilitation work. Appendix 1 provides a status of each of the Bureau's dams.

Overall management of the Bureau of Indian Affairs safety of dams program is vested in the Division of Water and Land Resources, located at the Central Office in Washington, D.C. Bureau area office engineers, designated as dam safety coordinators, execute the daily program activities, such as overseeing the technical aspects of the program and the activities contracted to or by the tribes under the Indian Self-Determination and Education Assistance Act, as amended (Public Laws 93-638 and 100-427).

The Congress appropriated the Bureau about \$43 million during fiscal years 1990 through 1993 for its safety of dams program. Bureau planning documents indicate that an additional \$313 million is needed to complete the repairs to the 70 Bureau dams by fiscal year 2000. However, the Bureau received program funds totaling only \$18 million for fiscal year 1994 and expects to receive another \$18 million for fiscal year 1995. As such, funding levels would have to increase significantly for the

¹The risk-of-failure is an engineering assessment that analyzes the probability that a structure is likely to deteriorate and release or fail to hold back the water that it was designed to control. The evaluation factors considered include items such as seepage, hydrology, static and dynamic stability, and liquefaction of surrounding or building material.

Bureau to complete the repairs by fiscal year 2000. Appendix 2 provides a breakdown of the projected costs associated with each of the Bureau's dams.

SCOPE OF AUDIT

We reviewed actions taken by the Bureau to implement the 10 recommendations made in our September 1989 audit report to accomplish the program in the most economical and efficient manner. For evaluation purposes, we included only the Bureau's 70 high or significant hazard dams identified in the June 1992 listing. Our review did not extensively evaluate the 24 dams identified recently in the draft listings, since the Bureau did not have time to make significant progress on these structures and the additional dams had not been formally approved at the time of our review.

Our program audit was made in accordance with the "Government Auditing Standards," issued by the Comptroller General of the United States. Accordingly, we included such tests of records and other auditing procedures that were considered necessary under the circumstances. We conducted our review at the Bureau's headquarters, area, and agency offices and at selected Federal, state, and tribal offices (see Appendix 3). As part of our review, we performed an evaluation of the Bureau's system of internal controls related to the program to the extent we considered necessary to accomplish our audit objective. In planning our audit, we also reviewed the Department of the Interior's Annual Statement and Report, required by the Federal Managers' Financial Integrity Act, for 1993. We noted that the Department was still reporting the material weakness associated with the operation and maintenance of Bureau dams that was identified in our prior audit report because some of the corrective actions were not scheduled to be completed until 1999. We did not find any additional material internal control weaknesses; however, we did identify areas wherein the Bureau could accomplish its program objectives more effectively. These areas are discussed in the Results of Audit section of this report. Our recommendations, if implemented, should improve the economy and efficiency of the program.

PRIOR AUDIT COVERAGE

During the past 5 years, the General Accounting Office and the Office of Inspector General have each issued an audit report that addressed the Bureau of Indian Affairs safety of dams program as follows:

The General Accounting Office report entitled "BIA and Indian Tribes Are Taking Action to Address Dam Safety Concerns" (No. GAO/RCED-92-50), issued on February 11, 1992, concluded that the Bureau had addressed key factors which contributed to its limited progress during the 1980s in correcting known or potential dam safety deficiencies and that efforts were under way at many of the Bureau's dams to accomplish the dam safety program. The report stated that contracts had been awarded (or were being actively negotiated) by the Bureau to

manage program activities on most of the dams ranked as high or significant hazards. In addition, the Congress authorized additional staff resources for the Bureau's safety of dams program and instructed the Department not to divert Bureau funds for fire suppression activities. To measure program progress and accomplishments at each dam, the report recommended that the Assistant Secretary for Indian Affairs develop and implement a management information system. The Acting Assistant Secretary agreed with the recommendation and directed the Bureau to implement a permanent information system by December 31, 1993. The Deputy Commissioner of Indian Affairs approved an interim system on February 27, 1992, but a permanent system had not been established at the time of our current review.

The Office of Inspector General report entitled "Dam Safety Program, Bureau of Indian Affairs" (No. 89-108), issued on September 5, 1989, concluded that the Bureau of Indian Affairs had not demonstrated an adequate commitment to the safety of dams program and had therefore made little progress in correcting safety deficiencies identified by the Bureau of Reclamation. The report stated that the Bureau of Indian Affairs had not taken sufficient actions to address safety concerns at 31 dams under its jurisdiction that were identified as posing a high or significant hazard and that were in poor or unsatisfactory condition. This situation occurred because the Bureau had not (1) assigned sufficient priority to the program, (2) restricted the operation of unsafe dams, and (3) effectively used available engineering and fiscal resources to identify and correct safety deficiencies. The lack of preventive maintenance also aggravated the hazards posed by unsafe dams. The Bureau agreed with and was implementing all 10 of the report's recommendations at the time of our current review.

RESULTS OF AUDIT

The Bureau of Indian Affairs has significantly improved management of its safety of dams program since our September 1989 audit report was issued. We also found that the Bureau was addressing dam safety problems systematically within given resources. However, we believe that the Bureau could increase program effectiveness and the potential for protecting lives and property by streamlining the process of determining the alternatives considered to mediate deficiencies; by installing early warning systems for each dam; and by preparing, testing, and updating emergency action plans.

Followup of Prior Audit Report Recommendations

We found that the Bureau had implemented or had taken corrective actions on the 10 audit recommendations made in our September 1989 report. For example, area directors certified that all dams were operated according to the proper operating criteria (Recommendation A. 1), the Bureau ensured that safety evaluation reports were distributed and used at the area and agency offices (Recommendation B.2), the Congress appropriated \$2 million (based on Bureau requests) for funding maintenance activities on dams in fiscal year 1994 and Bureau officials said that they

expected this level of funding to continue (Recommendation B.3), and the Bureau established a separate account for dam safety program funds under the Bureau's Federal Financial System (Recommendation C. 1). (The 10 recommendations in the September 1989 report and the actions taken by the Bureau to address the recommendations are summarized in Appendix 4.)

Program Streamlining

The Department's standards, criteria, and guidelines for dam safety are intended to promote a uniform and economical approach to dam safety practices and problems. Although application of these standards, criteria, and guidelines can vary depending on the size and function of the dam, the Bureau, in implementing these guidelines, is required to follow an extensive, formalized corrective action process. This formal process offers little opportunity for deviation, even when the dam is small or the corrective action is relatively minor. Since many of the Bureau's smaller dams impound water only periodically or have storage capacity of less than 1,000 acre-feet (see Appendix 5 for reservoir impoundment capacities), we believe that the Bureau can use less costly, nonstructural alternatives for these structures as follows:

In 1984, a safety evaluation report identified numerous deficiencies at the Santa Ana Dam, located in Santa Ana Pueblo, New Mexico. The earthen detention dam, with an impoundment capacity of about 560 acre-feet³ of water, essentially serves a flood control purpose. By 1994, work had proceeded only to the conceptual design phase, with about \$730,000 allotted for required studies to complete the deficiency verification phase. Bureau estimates to complete rehabilitation of the Dam are about \$29.8 million. However, engineers from both the Bureau's South Pueblo Agency and the Pueblo tribe's architectural and engineering firm stated that as an interim solution, the threat posed by the Dam could be reduced significantly by lowering its impoundment capacity and by installing an early warning system for a total cost of \$63,000. The engineers stated that a permanent solution to the safety problem would involve the construction of two or three smaller dams higher up in the watershed at a cost of about \$3.5 million. This alternative is substantially less than the estimated costs of rehabilitating the Santa Ana Dam.

Dam modification work on the Allen Dam, located on the Pine Ridge Reservation in South Dakota, is currently estimated to cost about \$1.8 million. The earthen storage dam, which can impound about 300 acre-feet of water, is used primarily for water supply and recreational purposes. The project is in the deficiency verification phase, and about \$100,000 has been obligated for this purpose. The Aberdeen Area Office's safety of dams coordinator told us that work could be completed faster and at less cost by reducing the time spent on some of the phases, combining parts of phases, designing the modification to meet the "worst case scenario," and then modifying the dam to this design. Based on the

³An acre-foot of water is the amount required to cover an acre of land to a depth of 1 foot (approximately 326,000 gallons).

coordinator's estimates, this approach could save as much as \$100,000 by reducing the extraneous effort required in the deficiency verification and conceptual design phases of the process, such as testing and evaluating different designs.

Modifications to correct the deficiencies identified at the Paguate North and South Dams, located on the Laguna Pueblo Reservation in New Mexico, are expected to cost about \$1.3 million, of which about \$600,000 has been spent. The two earthen dams, which are about 20 feet and 30 feet high with reservoir impoundment capacities of 50 acre-feet and 60 acre-feet, respectively, are used primarily for irrigation and recreational purposes. The Bureau's Laguna Agency engineer stated that about 4 years had been spent on studies and reports but that work on just the structural modifications could have been completed in about 60 days at substantially less cost.

Based on our review of the Bureau's inventory listing and status reports, we found that dam safety work on 43 of the 70 listed dams had not progressed beyond the deficiency verification phase. Bureau officials said that they believed the corrective action process was expensive and time-consuming because each of the four phases took approximately 1 year to complete. As such, a delay in any one phase delayed completion of the other phases and increased costs. Bureau officials stated that if they could exercise more flexibility earlier in the process, the safety of dams program could be operated more efficiently and at less cost. At the time of our current review, the Bureau was focusing its program resources on dam rehabilitation and construction modification work. Based on information provided to us by Bureau officials, we concluded that the program will not be completed for at least 17 more years at the current rate of funding. Therefore, while the formal corrective action process is needed to systematically identify and correct safety deficiencies at the Bureau's larger dams, the process appears to be expensive and burdensome at many of the Bureau's smaller dams.

Early Warning Systems

Early warning systems provide dam operators and other appropriate officials with the capability to remotely monitor, on a 24-hour basis, the climatic and hydrologic conditions surrounding a dam. Typically, early warning systems, such as those recently installed by the Confederated Salish and Kootenai Tribes of the Flathead Reservation, are housed in stand-alone, tamper-resistant enclosures. The systems consist of electronic or mechanical hardware⁴ that is fully integrated and strategically placed above, at, and below a dam or stream bed. This placement allows the electronic or mechanical sensors to monitor and transmit, via radio frequencies, information about conditions at the dam and its surrounding

⁴Hardware includes such items as directional antennas, emergency status circuits, real-time data transmitters, receivers/decoders, solar panels, air temperature sensors, repeater packages, precipitation gauges, pressure transducers, combination rain/snow and reservoir elevation stations, float systems, cables and batteries.

environment. The early warning systems provide on-line information, including reservoir and river levels, ambient temperatures, precipitation, and river flows. This remote-sensing capability assists officials in making decisions about potential threatening events and allows notification to local authorities in sufficient time to warn and/or evacuate populations placed at risk by either large operational releases of water or dam failures.

Although the Bureau's responsibilities do not specifically include providing public warning or evacuating impacted downstream areas, the Bureau is responsible, under its safety of dams program, for the integrity and safety of its structures. Based on our review, we found that only 26 of the 70 dams under the Bureau's jurisdiction have early warning systems to alert officials of pending danger or adverse consequences such as rising water levels or malfunctioning floodgates. We noted that the cost of these systems was between \$6,000 and \$154,000 depending on their complexity. However, the Bureau has recently designed, purchased, and installed systems at 15 of the 26 dams for a total cost of about \$607,000, or about \$40,000 per dam. As such, we believe that the installation of early warning systems is an inexpensive alternative to major rehabilitation work and provides an effective means of monitoring the sites during prolonged periods in which the dams are being evaluated for safety deficiencies, thereby increasing the Bureau's capability to protect downstream inhabitants and property. We believe that program officials, based on their recent accomplishments, should design and install a standard system at those dams that are classified as high or significant hazards which would require only minor site modifications.

Emergency Action Plans

The Departmental Manual (Part 753 DM 1.5) requires bureaus to prepare emergency action plans for each of their dams identified as high or significant hazards to provide operating personnel and local authorities with notification procedures to follow during an emergency situation or an unusual event. The plans include emergency procedures to provide warning to upstream and downstream inhabitants, to water-related facility operators, to recreational users, and to other persons who might be affected. The plans typically include inundation maps showing the areas that would be covered with floodwater if the dams were to fail and the names, addresses, and telephone numbers of key agency, tribal, law enforcement, and local community disaster personnel. Each plan is required to be updated annually and tested periodically to ensure that it serves its purpose.

We found that the Bureau had not prepared emergency action plans for 47 of its 70 high or significant hazard dams. Only 6 of the 23 plans prepared had been updated since January 1, 1993, and only 8 of the 23 plans had been tested within the last year. Emergency action plans have not been completed for 30 dams because the plans were in the draft stage pending installation of early warning systems, were awaiting final approval by the tribes, or were delayed for other reasons. The remaining 17 dams were low on the Bureau's priority system.

The emergency action plan for a dam is an integral part of any early warning system, as illustrated in the General Accounting Office's June 1977 report entitled "Actions Needed To Increase the Safety of Dams Built by the Bureau of Reclamation and the Corps of Engineers" (No. CED-77-85). The report concluded that the "confusion" and the "unclear communications" between the project staff and local officials before the Teton Dam collapsed, coupled with the "lack of preparedness" for the possibility of a dam failure, contributed significantly to the high loss of life and property damage. We believe that definitive emergency action plans should be prepared as soon as possible after a dam has been identified as a high or significant hazard. While developing action plans involves coordination between Bureau, tribal, and local community leaders, the potential consequences of a dam's failure dictate that the process be expedited.

Recommendations

We recommend that the Assistant Secretary for Indian Affairs:

1. Establish, in conjunction with the Departmental Dam Safety Task Force, procedures which allow safety of dams coordinators to institute cost-saving opportunities and alternatives to mitigate deficiencies in the safety of dams program as part of the formal corrective action process.
2. Perform a study of all high or significant hazard dams to determine the need for an early warning system to protect downstream inhabitants and property and require the Bureau to install such systems where needed.
3. Establish procedures which ensure that emergency action plans have been prepared and approved for all high or significant hazard dams, that the plans are kept current, and that the plans are tested periodically.

Bureau of Indian Affairs Response

The November 25, 1994, response from the Assistant Secretary - Indian Affairs (Appendix 6) stated that for Recommendation 1, the Bureau of Indian Affairs believes that procedures are already in place to allow for the identification of the most "economic remediation" methods available while also complying with engineering procedures established by the Bureau of Reclamation.

The Bureau of Indian Affairs concurred with Recommendations 2 and 3 and included a November 11, 1994, memorandum wherein it directed Area Directors to establish a review as an annual requirement of implementation of emergency action plans and early warning systems to ensure the Bureau's "continuing responsiveness" to safety of dams issues. The Bureau further stated that it, in conjunction with the Bureau of Reclamation, will develop and present a training course on safety of dams engineering principles and regulatory procedures to Bureau of Indian Affairs engineers in January 1995.

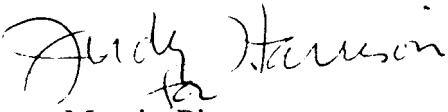
Office of Inspector General Comments

Based on the Bureau's response, we consider Recommendation 1 unresolved, and additional information is needed for Recommendations 2 and 3 (see Appendix 7).

Regarding Recommendation 1, during our review, safety of dams program coordinators and engineers continually cited the "lack of flexibility" in the program's process that precluded relatively minor problems from being corrected economically. Instead, according to these program officials, the process tends to drive the program and, as such, extends it and substantially increases its overall costs and consequently the risks posed by the structures. We agree with these program officials and believe that more effort needs to be made to change this process. Recommendation 1 was designed to allow the Bureau to work within the framework of the Departmental Dam Safety Task Force and thereby promote cost-saving opportunities while still complying with the engineering requirements established by the Bureau of Reclamation. We are not suggesting that the Bureau of Indian Affairs deviate from sound engineering principles; however, based on our review, we believe that opportunities do exist that can result in substantial cost savings but that they are not pursued because the process inhibits their implementation. As such, we are requesting that the Bureau reconsider its response to this recommendation.

In accordance with the Departmental Manual (360 DM 5.3), we are requesting a written response to this report by April 3, 1995. The response should provide the information requested in Appendix 7.

The legislation, as amended, creating the Office of Inspector General requires semiannual reporting to the Congress on all audit reports issued, actions taken to implement audit recommendations, and identification of each significant recommendation on which corrective action has not been taken.



Marvin Pierce

**STATUS OF BUREAU OF INDIAN AFFAIRS
70 HIGH OR SIGNIFICANT HAZARD DAMS***

D.O.I. FY 92 Rank	Area Office	Name of Dam	Hazard- Analysis	Safety- Report	Design Verification Analysis	Conceptual Design	Final Design	Construction	Complete
4	Navajo	Ganado						x	
5	Navajo	Round Rock						x	
7	Albuquerque	Black Rock					x		
10	Billings	Bonneau					x		
11	Portland	Equalizer			x				
12	Aberdeen	Crow Creek			x				
18	Navajo	Many Farms					x		
20	Aberdeen	Standing Rock No. 1							x
22	Navajo	Canyon Diablo			x				
25	Portland	Pablo							x
27	Albuquerque	Duke				x			
28	Aberdeen	Rosebud							x
29	Aberdeen	He Dog						x	
32	Aberdeen	White Clay							x
35	Billings	Washakie					x		
37	Portland	McDonald					x		
39	Albuquerque	Santa Ana Dam				x			
41	Aberdeen	Oglala							x
42	Portland	Lower Dry Fork			x				
44	Phoenix	Weber					x		
47	Phoenix	Tufa Stone			x				
48	Portland	Indian Lake			x				
49	Portland	Jocko		x					
50	Portland	Black Lake							x
53	Aberdeen	Parmalee					x		
56	Albuquerque	Acomita					x		
57	Navajo	Captain Tom Darn		x					
58	Albuquerque	Lower Mundo				x			
59	Portland	Upper Dry Fork			x				
61	Phoenix	Coolidge						x	
63	Billings	East Fork			x				
65	Aberdeen	Indian Scout			x				
66	Albuquerque	Paguate North				x			
67	Albuquerque	Paguate South				x			
68	Phoenix	Pasture Canyon	x						
69	Navajo	Wheatfields		x					

*Status is as of May 1994 and does not include the 24 recently identified dams on the draft technical priority listing, since these dams were all in the hazard analysis stage.

APPENDIX 1
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D.O.I. FY 92 Rank	Area Office	Name of Dam	Hazard- Analysis	Safety- Report	Design Verification Analysis	Conceptual Design	Final Design	Construction	Complete
70	Portland	crow		x					
72	Aberdeen	Ponca							x
75	Billings	Agency		x					
76	Billings	Ray Lake					x		
78	Portland	Ninepipe		x					
80	Portland	Kicking Horse		x					
81	Albuquerque	La Jara				x			
82	Albuquerque	Lake Mescalero Dam					x		
83	Aberdeen	Wanblee	x						
84	Aberdeen	Kyle			x				
114	Phoenix	Tuve	x						
127	Navajo	Cutter		x					
130	Portland	Tabor			x				
131	Navajo	Wauneka	x						
132	Portland	Hell Roaring		x					
136	Phoenix	Elgo		x					
144	Portland	Twin/Turtle		x					
169	Portland	Little Bitterroot		x					
180	Aberdeen	Ghost Hawk			x				
182	Aberdeen	Ring Thunder			x				
189	Navajo	Assayi		x					
203	Navajo	Tsaile		x					
219	Aberdeen	Allen			x				
230	Navajo	Red Lake		x					
238	Phoenix	Wild Horse		x					
244	Portland	Hubbart		x					
250	Phoenix	Bottle Hollow		x					
251	Portland	Mission		x					
269	Billings	Lower Two Medicine		x					
272	Portland	Blackfoot		x					
324	Billings	Willow Creek		x					
340	Phoenix	Headgate Rock		x					
353	Navajo	Blue Canyon		x					
359	Phoenix	Tat Momolikot		x					

**PROJECTED COST OF BUREAU OF INDIAN AFFAIRS
70 HIGH OR SIGNIFICANT HAZARD DAMS***

D.O.I. FY 1992 Rank	Area Office	Name of Dam	Total Cost Projection FYs 1994-2000 (000's)
4	Navajo	Ganado	\$10,230
5	Navajo	Round Rock	200
7	Albuquerque	Black Rock	10,510
10	Billings	Bonneau	7,507
11	Portland	Equalizer	2,650
12	Aberdeen	Crow Creek	5,240
18	Navajo	Many Farms	13,495
19	Aberdeen	Standing Reck No. 1	10
22	Navajo	Canyon Diablo	6,307
25	Portland	Pablo	540
27	Albuquerque	Dulce	7,978
28	Aberdeen	Rosebud	10
29	Aberdeen	He Dog	10
32	Aberdeen	White Clay	10
35	Billings	Washakie	6,504
37	Portland	McDonald	5,500
39	Albuquerque	Santa Ana Dam	29,815
41	Aberdeen	Oglala	10
42	Portland	Lower Dry Fork	6,500
44	Phoenix	Weber	8,810
47	Phoenix	Tufa Stone	5,970
48	Portland	Indian Lake	1,300
49	Portland	Jocko	1,250
50	Portland	Black Lake	510
53	Aberdeen	Parmalee	4,340
56	Albuquerque	Acomita	3,280
57	Navajo	Captain Tom Darn	11,350
58	Albuquerque	Lower Mundo	3,030
59	Portland	Upper Dry Fork	6,720
61	Phoenix	Coolidge	50
63	Billings	East Fork	3,363
65	Aberdeen	Indian Scout	2,630
66/67	Albuquerque	Paguate North/South	700
68	Phoenix	Pasture Canyon	2,110
69	Navajo	Wheatfields	6,560

*Bureau cost projections are as of December 1993 and do not include the 24 recently identified Bureau dams in the Department's May 3, 1994, draft technical priority rating.

APPENDIX 2
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D.O.I. FY 1992 Rank	Area Office	Name of Dam	Total Cost Projection FYs 1994-2000 (000's)
			I
70	Portland	Crow	6,950
72	Aberdeen	Ponca	10
75	Billings	Agency	2,746
76	Billings	Ray Lake	2,506
78	Portland	Ninepipe	I 4,040
80	Portland	Kicking Horse	2,800
81	Albuquerque	La Jara	2,681
82	Albuquerque	Lake Mescalero Dam	3,740
83	Aberdeen	Wanblee	760
84	Aberdeen	Kyle	1,570
114	Phoenix	Tuve	1,990
127	Navajo	Cutter	12,380
130	Portland	Tabor	6,740
131	Navajo	Wauneka	I -0-
132	Portland	Hell Roaring	700
136	Phoenix	Elgo	5,600
144	Portland	Twin/Turtle	700
169	Portland	Little Bitterroot	1,000
180	Aberdeen	Ghost Hawk	1,000
182	Aberdeen	Ring Thunder	1,850
189	Navajo	Assayi	7,560
203	Navajo	Tsaille	12,250
219	Aberdeen	Allen	1,700
230	Navajo	Red Lake	9,850
238	Phoenix	Wild Home	550
244	Portland	Hubbart	4,930
250	Phoenix	Bottle Hollow	3,620
251	Portland	Mission	5,800
269	Billings	Lower Two Medicine	784
272	Portland	Blackfoot	180
324	Billings	Willow Creek	2,773
340	Phoenix	Headgate Rock	10
353	Navajo	Blue Canyon	5,300
359	Phoenix	Tat Momolikot	10
		Program Overhead and Other Costs	<u>22,615</u>
		Total Projected Costs	<u>\$312,664</u>

OFFICES VISITED OR CONTACTED

Bureau of Indian Affairs

Central Office, Washington, D.C.
Aberdeen Area Office, Aberdeen, South Dakota
 Crow Creek Agency, Fort Thompson, South Dakota
 Pine Ridge Agency, Pine Ridge, South Dakota*
 Rosebud Agency, Rosebud, South Dakota
Albuquerque Area Office, Albuquerque, New Mexico
 Laguna Agency, Laguna, New Mexico*
 Southern Pueblos Agency, Albuquerque, New Mexico
 Jicarilla Agency, Dulce, New Mexico*
 Zuni Agency, Zuni, New Mexico*
Billings Area Office, Billings, Montana*
Navajo Area Office, Gallup, New Mexico, and Window Rock, Arizona
Phoenix Area Office, Phoenix, Arizona
Portland Area Office, Portland, Oregon*
 Flathead Agency, Pablo, Montana
 Fort Hall Agency, Fort Hall, Idaho*
 Umatilla Agency, Pendleton, Oregon*
Sacramento Area Office, Sacramento, California

Tribal Governments

Pueblo of Acoma, Acomita, New Mexico
Chippewa Cree Tribe of Rocky Boys Reservation, Box Elder, Montana*
Confederated Salish and Kootenai Tribes of the Flathead Reservation,
 Pablo, Montana
Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon*
Jicarilla Apache Tribe, Dulce, New Mexico*
Navajo Nation, Window Rock, Arizona
Oglala Sioux Tribe, Pine Ridge, South Dakota*
Pueblo of Laguna, Laguna, New Mexico*
Rosebud Sioux Tribe, Rosebud, South Dakota
Pueblo of Santa Ana, Santa Ana Pueblo, New Mexico*
Walker River Paiute Indian Tribes, Schurz, Nevada*
Pueblo of Zuni, Zuni, New Mexico*

Bureau of Reclamation

Dam Safety Office, Denver, Colorado”
Geotechnical Engineering and Embankment Dams Branch, Denver, Colorado*
Upper Colorado Regional Office, Salt Lake City, Utah*
Navajo Indian Irrigation Project Office, Farmington, New Mexico”

U.S. Army Corps of Engineers

General Engineering Branch, Civil Works Division, Washington, D. C.*
Chief of Engineering, Sacramento District Office, Sacramento, California*
Operations Branch, Sacramento District Office, Sacramento, California”

U.S. Department of Agriculture’s Soil Conservation Service

Water Safety Projects Division, Washington, D. C.”

State of California

Department of Water Resources, Safety of Dams Branch, Water Resources
Department Sacramento, California*

Other Entities

Laguna Construction Company, Pueblo of Laguna, New Mexico*

**SUMMARY OF RECOMMENDATIONS AND CORRECTIVE ACTIONS
FOR AUDIT REPORT
“DAM SAFETY PROGRAM, BUREAU OF INDIAN AFFAIRS”
(NO. 89-108)**

<u>Recommendations</u>	<u>Corrective Actions</u>
<p>A. 1. Establish operating criteria for each dam in “unsatisfactory” or “poor” condition and restrict reservoir impoundments accordingly to reduce potential for dam failure and the resultant loss of life and property.</p> <p>A.2. Require all area offices to initiate contractual agreements to perform the post-evaluation and corrective action steps of the dam safety program, including contracts with the Bureau of Reclamation for use of engineering resources under the terms of the existing Memorandum of Interagency Agreement dated July 2, 1987. In addition, implement a systematic action program for each dam similar to the one agreed upon by the Bureau of Indian Affairs and the Bureau of Reclamation in February 1988.</p>	<p>The Bureau agreed to establish operating criteria for each dam in satisfactory, unsatisfactory, and poor condition. The Bureau’s area directors certified that their dams were operated in accordance with the proper operating criteria.</p> <p>The Bureau has contracted much of its safety of dams program to various Indian tribes under Public Law 93-638. The tribes, in turn, contract with the Bureau of Reclamation and architect and engineering firms for technical expertise. In those cases where the tribes do not want to manage the program, the Bureau of Indian Affairs contracts directly with the Bureau of Reclamation. As discussed in our current report the Bureau of Indian Affairs has implemented a systematic plan of action for each dam that is identified on the Department’s priority listing.</p>

Recommendations	Corrective Actions
A.3. Identify the economic value and trust responsibility for each dam to determine which dams serve useful purposes and warrant dam safety expenditures. For those dams not serving useful purposes, take appropriate action, such as draining or breaching, to eliminate the potential hazard.	The Bureau was addressing the economic value of the dams in the conceptual design phase of the program. However, since most of the dams have not yet reached this phase of the program, the recommendation will not be fully implemented until 1999.
A.4. Obtain the Solicitor's assistance to identify those cases where repayment of program expenditures is required and establish criteria, guidelines, and contracts for repayment. If repayment issues cannot be resolved, seek appropriate legislation.	In December 1991, the Bureau requested the Department's Solicitor to determine whether funds appropriated for safety of dams activities at the Flathead Indian Irrigation Project's Black Lake Dam could be expended on a nonreimbursable basis. In a March 1992 opinion, the Acting Associate Solicitor for Indian Affairs concluded that appropriations for safety of dams work were intended to be expended on a nonreimbursable basis.
B.1. Determine total responsibility for maintaining each dam and ensure that recurring routine maintenance programs are fully implemented.	The Bureau determined that it was responsible, per 55 BIAM, Supplement 6, for maintaining the dams. Legislation is pending in the Congress that would establish a program for the maintenance of dams located on Indian lands.
B.2. Distribute dam safety examination reports to responsible dam operators and maintenance officials and establish followup procedures to ensure that routine maintenance problems are corrected.	The Bureau's Central Office is distributing the examination reports to the respective area offices, agency offices, and tribes. Routine maintenance items identified in the examination reports were being corrected in fiscal year 1994.

<u>Recommendations</u>	<u>Corrective Actions</u>
B.3. Establish routine periodic maintenance as a long-term commitment and request sufficient funding to ensure its accomplishment.	The Bureau now receives dam safety operation and maintenance funds under the Irrigation Operation and Maintenance program element. The Bureau received dam maintenance funds of \$2 million in fiscal year 1994 and expects to receive another \$2 million in fiscal year 1995.
C1. Use separate accounts or otherwise separately account for the dam safety funds and expenditures program.	The Bureau established a separate account for the safety of dams program in the Federal Financial System. Safety of dams program funds are now included in the resource management construction activity under program element 12400.
C.2. Remove past dam safety program budgeted items and related costs from the commingled accounts and account for these costs as recommended above.	The Bureau removed the funds from the commingled account. As discussed previously, the establishment of the safety of dams program element has segregated the program from all other resource management construction program elements.
C.3. Reconcile program appropriations, allotments, obligations, and expenditures and adjust the Navajo Area Office Many Farms Dam account for the \$482,000 discrepancy.	The Bureau adjusted for the discrepancy by decreasing the Navajo Indian Irrigation Project account balance and increasing the safety of dams program account balance.

**RESERVOIR IMPOUNDMENT CAPACITIES OF
BUREAU OF INDIAN AFFAIRS DAMS**

<u>Acre-Foot Capacities</u>	<u>Number of Listed Dams</u>		
	<u>Approved</u>	<u>Draft</u>	<u>Total</u>
0-49	1	8	9
50-99	7	1	8
100-499	6	5	11
500-999	10	4	14
1,000-4,999	16	1	17
5,000-9,000	9	4	13
10,000-19,999	9	1	10
20,000-99,999	9	0	9
over 100,000	3	0	3
Total	70	24	94



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

NOV 25 1994

Memorandum

To: Assistant Inspector General
Paul J. Miller
From: ~~for~~ Ada E. Deer
Assistant Secretary - Indian Affairs

Subject: OIG Draft Audit W-IN-BIA-001-94 - Safety of Dams Program,
BIA

On September 8, 1994, a representative from your office conducted a close-out meeting with the Bureau of Indian Affairs (Bureau) personnel to discuss the recommendations included in the subject audit. At that time, the Bureau raised a number of concerns with the recommendations in the Preliminary Draft Audit Report. There was agreement that the Bureau's ability to respond to the audit recommendations is constrained by the engineering requirements defined by the Bureau of Reclamation (Reclamation). We anticipated that the Draft Audit Report would be modified to condition the recommendation on Reclamation's concurrence in Bureau proposals. We also understood the Draft Audit Report would condition its recommendation for Early Warning Systems (EWS) on the results from the Emergency Action Plan (EAP) recommendations and would address both issues together in one recommendation. None of these changes were incorporated into the Draft Report, even though the final sentence of the report says that "The representatives generally agreed with the report's finding and recommendations." Given the fact that none of the agreed changes were made, we request that the above cited sentence be deleted from the report. We further question the exit conference process, itself, as the commitments made on behalf of your office were not kept.

Below are our responses to the audit recommendations:

Recommendation A1: Establish, in conjunction with the Departmental Dam Safety Task Force, procedures which allow safety of dams coordinators to institute cost-saving opportunities and alternatives to mitigate deficiencies in the safety of dams program as part of the formal corrective action process.

Response: The Bureau believes that the procedures in place already allow for the identification of the most economic remediation methods while complying with engineering procedures established by Reclamation and while serving the interest of the benefiting tribes.

Recommendation A.2: Perform a study of all "high" or "significant" hazard dams to determine the need for an EWS to protect downstream inhabitants and property and require the Bureau to install such systems where needed.

Recommendation A.3: Establish procedures which ensure that emergency action plans have been prepared and approved for all high or significant hazard dams, that the plans are kept current, and that the plans are tested periodically.

Response to A.2 and A.3: The Bureau concurs. The attached memorandum dated November 11, 1994, advised Area Directors who have "high" or "significant" risk dams within their jurisdiction of the need for appropriate EAP's and EWS for those dams. The memo establishes the review of EAP and EWS implementation as an annual requirement to be met by the Area Directors to ensure the Bureau's continuing responsiveness to safety of dams issues. The Bureau's Safety of Dams Officers will evaluate EAP and EWS implementation starting November 30, 1994. This evaluation will be completed by April 1995. Further, the Bureau is working with Reclamation to develop and present a training course during January 1995, to Bureau engineers to bring them current on safety of dams engineering principles and regulatory procedures issued.

Attachment

STATUS OF AUDIT REPORT RECOMMENDATIONS

Finding/ Recommendation Reference	Status	Action Required
1	Unresolved.	Reconsider the recommendation, and provide an action plan that includes target dates and titles of officials responsible for implementation.
2 and 3	Management concurs; additional information needed.	Provide the titles of officials responsible for implementation.

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